There is no explicit suggestion in the references to combine them to obtain the present invention, as the Examiner apparently recognizes. Moreover, none of the references, alone or in combination, addresses the problems solved by the present invention (i.e., improved shock resistance and durability without reduction of S/N ratio), let alone suggest the claimed solution to those problems. Ishikawa et al. addressed flying height and high recording density (See Abstract), and Okumura et al. developed a medium having improved heat conductivity (See Abstract). Chen et al. addressed Li migration problems (See Abstract). In fact, Chen et al. teaches away from using the Cr alloy underlayer of the present invention by noting that Cr alloy underlayers do not prevent Li migration. Col. 3, 47-50.

Even if it would have been obvious to try some combination of the cited references, it would not have been obvious that the combination would work to obtain the claimed invention. Without a reasonable expectation of success, the present rejection cannot be sustained. <u>In re Vaeck</u>, 20 USPQ 2d 1438 (Fed. Cir. 1991). After all, none of the references alone obtains the result of the present invention, and none of the references obtain shock resistance and durability without reduction of S/N ratio in the manner of the present invention. The Examiner is clearly using hindsight to reconstruct the present invention by combining bits and pieces of the cited references, which is improper.

As has been argued, the present invention is based on a novel combination of features, each of which is separately disclosed in the cited references, as the Examiner noted in the Office Action. However, the references do not teach a specific combination of the

features recited in amended claim 1, or the result obtained from such a combination. Applicants believe that the novel combination of the present invention cannot be easily realized by a person skilled in the art based on the cited references.

The present invention features (1) a glass substrate, (2) a composition of a magnetic recording layer, (3) texturing of a NiP layer (second underlayer), (4) use of a CrMo layer (third underlayer) and (5) Cr layer inserted as an adhesion layer between the glass substrate in the NiP layer.

According to the present invention, excellent shock resistance and durability can be obtained in the resulting magnetic recording disk without suffering from a reduction of S/N ratio. As discussed in the prior art section of the specification, JPP `941 and `471 teach use of a glass substrate for the disk, but they could not ensure a high S/N ratio. Surprisingly, according to the present invention, a high S/N can be obtained in the disk with the glass substrate because of improvements in other layers of the disk, especially the magnetic recording layer and the NiP layer.

As recited in amended claim 1, the magnetic recording layer contains at least 14 at % of Cr and at least 4 at % of Pt. The present inventors have found that if such specific Cr and Pt contents are combined with texturing of the underlying NiP layer, peripheral anisotropy of the magnetic layer can be significantly increased, thus ensuring an improvement of the S/N ratio.

With regard to texturing of the NiP layer, the inventors have also found that surface roughness of the NiP should be lowered to obtain a good GH (Grid Height), and preferably Ra_2 in a radial direction is less than 2 nm, as recited in amended claim 1.

To obtain such a low surface roughness, the inventors have found that a Cr layer (first underlayer) inserted between the glass substrate and the NiP layer for improving adhesion strength should be as thin as possible, because a thick Cr layer can increase a grain size of Cr, thus increasing the surface roughness. Thus, the Cr layer has a thickness of 5 to 25 nm, as recited in amended claim 1.

Furthermore, the inventors have found that a CrMo layer should be added as a third underlayer to obtain a widened lattice spacing, thereby accelerating a preferential longitudinal orientation for the C-axis of the magnetic layer.

Comparing the present invention with USP `890, USP `890 teaches use of a glass substrate in the disk. However, USP `890 does not teach texturing of the NiP layer, because the NiP layer is used as a sealing layer for preventing Li migration, as disclosed in column 5, lines 13 to 28. That is, USP `890 is silent concerning texturing of the NiP layer, as in the present invention, which improves S/N ratio.

Further, in USP `890, the Cr underlayer is used as an adhesion layer without reducing the sealing effect of the NiP layer, as disclosed in column 5, lines 51 to 56. That is, while the Cr underlayer is deposited at a thickness of about 1.5 to 20 nm, as is disclosed in

column 6, line 57, the thickness has no relevancy to texturing of the NiP layer. Thus, USP `890 cannot contribute to the present invention in the absence of texturing of the NiP layer.

The Examiner correctly observes that USP `733 teaches texturing of the NiP layer. However, USP `733 is distinguished from the present invention for the following reasons.

(1) In Table 1 (column 6), USP `733 teaches use of CoCrPtTa as a magnetic recording layer (6). However, its Cr content is only 6 at %, while the magnetic layer of the present invention contains at least 14 at % of Cr to obtain an increased S/N ratio.

(2) The Cr layer (2) is sandwiched between the glass substrate (1) and the NiP layer (3). However, the Cr layer (2) has a thickness of 30 to 200 nm (column 3, lines 56 to 58) and 100 nm (column 5, lines 58 to 61), while the Cr layer of the present invention has a thickness of 5 to 25 nm. As discussed above, the smaller thickness is essential to the Cr layer of the present invention to improve the texturing effects. In USP `733, the Cr layer (2) should have a thickness of at least 30 nm to obtain a large heat possessing capacity, as disclosed in column 3, lines 58 to 63.

(3) In USP `733, the underlying Cr layer (5) is sandwiched between the NiP layer (3) and the magnetic recording layer (6). Contrary to this, according to the present invention, to obtain a widened lattice spacing, a CrMo layer is applied between the NiP layer and the magnetic recording layer.

Due to the above-discussed differences, a person skilled in the art would not be motivated to combine USP `890 with USP `733 and USP `021, thereby completing the present invention.

For the foregoing reasons, applicants believe that this case is in condition for allowance, which is respectfully requested. The examiner should call applicants' attorney if an interview would expedite prosecution.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment, captioned **"Version with markings to show changes made."**

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claim 1 has been amended as follows:

1. (Amended Four Times) A magnetic recording disk comprising a nonmagnetic glass ~~or silicon~~ substrate having non-oriented irregularities on a surface thereof, and, having applied thereon in the following order:

an underlayer which comprises a first underlayer consisting of~~containing~~ chromium ~~as a principal component thereof~~ and having a thickness of 5 to 25 nm, a second sputtered underlayer consisting of nickel and phosphorus and a third underlayer consisting of~~containing~~ chromium and molybdenum~~as a principal component thereof~~ which are formed in the described order,

wherein said second underlayer has a thickness of not less than 5 nm, contains P in the concentration of 15 to 33 atom % in the NiP layer and has a mechanically textured structure having a surface roughness Ra_2 in a radial direction of less than 2 nm, and said third underlayer has a thickness of not more than 60 nm and has a widened lattice spacing approaching the lattice spacing of a magnetic recording layer formed thereon, and

a magnetic recording layer which has a circumferential direction of easy magnetization and contains cobalt as a principal component thereof, and also contains chromium in an amount of at least 14 at % and platinum in an amount of at least 4 at % in combination with tantalum or tantalum and niobium.